



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

b. Ritter, *La famille et la jeunesse de Rousseau*. Rev. Hist. Litt. France.

c. Le Breton, Rivarol. Rev. Hist. France.

d. Ricardou, *La critique litt.* Rev. Hist. Litt. France.

1897. a. Rossel, *Relat. Litt. entre la France et l'Allemagne*. Rev. Hist. Litt. France.

b. Betz, Pierre Bayle. Rev. Hist. Litt. France.

c. Ritter, Bealt de Muralt. Rev. Hist. Litt. France.

d. Harkensee, Beitr. z. Gesch. d. Emigranten in Frankr. Rev. Hist. Litt. France.

1898. a. Souriau, *Préface de Cromwell*. Rev. Hist. Litt. France.

b. Bertrand, *La fin du Classicisme*, etc. Rev. Hist. Litt. France.

1899. a. Jusserand, *Shakspeare en France*. Rev. Hist. Litt. France.

b. Bouvy, *Voltaire et l'Italie*. Rev. Hist. Litt. France.

c. Taphanel, *La Beaumelle et Saint-Cyr*. Rev. Hist. Litt. France.

d. Aubertin, *La versification franç.* Rev. Philol. Franç.

IV. *Reviews on Texte.*

1895. M. de Vogüé. Rev. des Deux-Mondes, pp. 676-691.

1896. a. Souriau. Rev. Hist. Litt. France, iii, pp. 128-131.

b. Wells, MOD. LANG. NOTES, pp. 225-232.

c. Betz, Zts. Spr. Litt. xviii, pp. 153-182. These reviews are on his *J. J. Rousseau*, etc.

1899. Leslie Stephen. The National Review, pp. 378-391.

1900. Obsèques de M. Texte. Bull. de la Soc. des Amis de l'Univ. de Lyon.

1901. Notice nécrologique sur Joseph Texte. L'Annuaire de l'Assoc. Amicale des Anciens Elèves de l'Ecole Normale Supérieure.

HUGO P. THIEME.

University of Michigan.

PARADISE LOST vii. 364-366.

THIS passage,

Hither, as to their fountains, other stars
Repairing, in their golden urns draw light,
And hence the morning planet gilds her horns,

has received but scant illustration at the hands of the commentators. Newton remarks that

the sun is called *fons luminis* by Lucretius (5.281), with which Munro (on the passage) compares v. 293, while on 'golden urns' Stillingfleet quotes Aristophanes, *Clouds* 271, where, however, the expression is used literally. The general thought, apart from the imagery, is better illustrated by Manilius, *Astron.* 2. 8-11, where the poet is referring to Homer as the source of later poetry:

Cujus de gurgite vivo

Omnis posteritas latices in carmina duxit,
Amnemque in tenues ausa est deducere rivos,
Unius fecunda bonis,

Cf. Ovid, *Am.* 3. 9. 25-6.

Yet, after all, it must be admitted that these lines correspond better with the figurative sense in which the first two of the Miltonic lines are sometimes employed, and that they have no application to the third. The third, in fact, seems of a different order from the other two. 'In their golden urns draw light' is mythological in conception, while the following line, though still poetical, seems more precise. The 'her,' substituted in the second edition for 'his,' can only refer to Venus. 'Horns,' in this metaphorical sense, is applied by ancient writers only to the moon: thus *νεπαία*, Aratus 732, 777, 779, 784, 787, 789, 793, 799; Cic. *Fragm.* ap. Nonius, p. 122.2; Varro in Plin. 8. 79; Avienus 121; Virgil, *Georg.* 1.433; *Æn.* 3.645; Ovid, *Met.* 1.11; 2.117, 344, 453; 3.682; 7.179; 10.296, 479; cf. 9.689, 784; 12.264. Shakespeare limits its application in the same way: *M. N. D.* 244, 246; *Cor.* 4. 6. 44; *Ant.* 4. 12. 45. Even Milton himself in other passages restricts himself to the ancient use: *P. L.* 1. 439; 4. 978; 10. 433. Hence it is not a little remarkable that he here makes an exception in assigning horns to Venus, while affirming that she draws her light from the sun. But the explanation is easily found if we remember that the phases of Venus, already predicted by Copernicus nearly three quarters of a century before, were discovered by Galileo in 1610. It was Galileo then, as we shall see, who first spoke of the horns of Venus as an observed phenomenon; it was Galileo who first saw its 'extremely slender horns' as morning star; and it was Galileo who, in one of the letters in which he announced his discovery at the very close of the year 1610, announced that the

planets—but not the fixed stars—were dark in themselves, and borrowed their light wholly from the sun. Moreover, Galileo expressly compares the form of Venus with that of the moon, first of all in the famous anagram of December 11, 1610, with its two meaningless letters at the end:

Haec immatura a me jam frustra leguntur o y,

which, according to his own later interpretation becomes

Cynthiae figuras aemulatur Mater amorum.¹

The intrinsic interest of the letters in which Galileo announces this discovery, the fact that they are not easily accessible in compends (the first is even sometimes said to be addressed to Kepler), and the literal correspondence with some of Milton's phrases, must be my excuse for printing them at such length. I know not where one can see a more fascinating exhibition of science in the making. I quote the letters in the Florence edition of 1842-56 (the italics are of course mine, save for the anagram and its solution).

The first is a letter from Galileo to Giuliano de' Medici, Ambassador from the Grand Duke of Tuscany to the Emperor Rudolph II at Prague, dated Florence, December 11, 1610 (*Opere* 6. 128):

'Intanto mando la cifra di un altro particolare osservato da me nuovamente, il quale si tira dietro la decisione di grandissime controversie in Astronomia, ed in particolare contiene in sè un gagliardo argomento per la costituzione dell' 'Universo, e a suo tempo pubblicherò in deciferazione, ed altri particolari. Frattanto le lettere trasposte sono queste:

Haec immatura a me jam frustra leguntur o y.'

The second is from Galileo to Father Cristoforo Clavio at Rome, dated Florence, December 30, 1610 (*Opere* 6. 130-1):

'Intanto non voglio celare a V. R. quello che ho osservato in Venere da tre mesi in qua. Sappia dunque, come nel principio della sua apparizione vespertina la cominciai ad osservare, e la vidi di figura rotonda, ma piccolissima; continuando poi le osservazioni venne crescendo in mode notabilmente, e pur man-

¹ Since writing this paper, I find that Orchard, *The Astronomy of Paradise Lost*, p. 133, has given the same explanation of this line, but apparently without direct knowledge of Galileo's writings.

tenendosi circolare, sin che avvicinandosi alla massima digressione cominciò a diminuir dalla rotondità nella parte avversa al Sole, e in pochi giorni si ridusse alla figura semicircolare, nella qual figura si è mantenuta un pezzo, cioè sino che ha cominciato a ritirarsi verso il Sole, allontanandosi pian piano dalla tangente; ora comincia a farsi notabilmente *cornicolata*, e così anderà assottigliandosi sin che si vedrà vespertina; e a suo tempo la vedremo *matutina*, con le sue *cornicelle sottilissime* e avverse al Sole, le quali intorno alla massima digressione faranno mezzo cerchio, il quale manterranno inalterato per molti giorni. Passerà poi Venere dal mezzo cerchio al tutto tondo prestissimo, e poi per molti mesi la vedremo così interamente circolare, ma piccolina, sì che il suo diametro non sarà la sesta parte di quello che apparisce adesso. Io ho modo di vederla così netta, così schietta, così terminata, *come veggiamo l'istessa Luna* con l'occhio naturale; e la veggio adesso di diametro eguale al semidiametro della Luna veduta colla vista semplice. Ora eccoci, Signor mio, chiariti come Venere (e indubitatamente farà l'istesso Mercurio) va intorno al Sole, centro senza alcun dubbio delle massime rivoluzioni di tutti i pianeti; *inoltre siamo certi come essi pianeti sono per sè tenebrosi, e solo risplendono illustrati dal Sole (il che non credo che occorra delle fisse per alcune mie osservazioni)*, e come questo sistema dei pianeti sta sicuramente in altra maniera di quello che si è comunemente tenuto.'

The third is a letter to Father Benedetto Castelli at Brescia, dated the same day, December 30, 1610 (*Opere* 6. 134-5):

'Sappia dunque che io, circa tre mesi fa, cominciai ad osservar Venere collo strumento, e la vidi di figura rotonda, ed assai piccola; andò di giorno in giorno crescendo in mole, e mantenendopure la medesima rotondità, finchè finalmente venendo in assai gran lontananza da Sole cominciò a scemare della rotondità dalla parte orientale, ed in pochi giorni si ridusse al mezzo cerchio. In tal figura si è mantenuta molti giorni, ma però crescendo tuttavia in mole; ora comincia a farci *falcata*, e finchè si vedrà vespertina, anderà scemando le sue *cornicelle* fin tanto che svanirà; ma ritornando poi *matutina* si vedrà *colle corna sottilissime*, e puro avverse al Sole, e anderà crescendo verso il mezzo cerchio sino alla sua massima digressione. Manterrassi poi semicircolare per alquanti giorni, diminuendo però in mole; e poi dal mezzo cerchio passerà al tutto tondo in pochi giorni, e quindi per molti mesi si vedrà, e *Lucifero* e *Vesperugo*, tutta tonda, ma piccoletta di mole. Le evidentissime conseguenze, che di qui si traggono, sono a V. R. notissime. . . Ma Venere la vedo così spedita e terminata *quanto l'istessa Luna*, mostran-

domela l'occhiale di diametro eguale al semi-diametro di essa Luna veduta coll' occhio naturale.'

The fourth and last is a letter to Giuliano de' Medici, dated January 1, 1611:

'E tempo che io deciferi a V. S. Illustriss. e Reverendiss., e per lei al Sig. Keplero, le lettere trasposte, le quali alcune settimane sono le inviai; é tempo, dico, giacchè sono interamente chiaro della verità del fatto, sicchè non ci resta un minimo scrupolo o dubbio. Sappranno dunque come, circa a tre mesi fa, vedendosi Venere vespertina, la cominciai ad osservare diligentemente coll' occhiale, per veder col senso stesso quello di che non dubitava punto l' intelletto. La vidi dunque sul principio di figura rotonda, pulita, e terminata, ma molto piccola; di tal figura si mantenne sin che cominciai ad avvicinarsi alla sua massima digressione, ma tra tanto andò crescendo in mole. Cominciò poi a mancare dalla rotondità nella sua parte orientale, ed avversa al Sole, e in pochi giorni si ridusse ad esser un mezzo cerchio perfettissimo, e tale si mantenne, senza punto alterarsi, finchè incominciò a ritirarsi verso il Sole, allontanandosi dalla tangente. Ora va calando dal mezzo cerchio, e si mostra *cornicolata*, e anderà assottigliandosi sino all' occultazione, riducendosi allora con *corna sottilissime*: quindi passando all'apparizione *matutina*, la vedremo pur *falcata e sottilissima*, e colle *corna* avverse al Sole; anderà poi crescendo fino alla massima digressione, dove apparirà semicircolare, e tale senza alterarsi si manterrà molti giorni, e poi dal mezzo cerchio passerà presto al tutto tondo, e così rotondo si conserverà poi per molti mesi. Il suo diametro adesso è circa cinque volte maggiore di quello che si mostrava nella sua prima apparizione vespertina; dalla quale mirabile esperienza abbiamo sensata e certa dimostrazione di due gran questioni state fin qui dubbie tra i maggiori ingegni del mondo. L'una è che *i pianeti tutti son di lor natura tenebrosi (accadendo anco a Mercurio l'istesso che a Venere)*; l'altra, che Venere necessarissimamente si volge intorno al Sole, come anco Mercurio; cosa che degli altri pianeti fu creduta da' Pitagorici, dal Copernico, dal Keplero, e da' loro seguaci, ma non sensatamente provata, come ora in Venere ed in Mercurio. Averanno dunque il Sig. Keplero e gli altri Copernicani da gloriarsi di aver creduto e filosofato bene, sebbene ci è toccato, e ci è per toccare ancora, ad esser reputati dall' università dei filosofi *in libris* per poco intendenti, e poco meno che stolti. Le parole, dunque, che mandai trasposte, e che dicevano

Hæc immatura a me jam frustra leguntur o y,
dicono ordinate

Cynthia figuræ amulatur Mater amorum
(Venere imita le figure della Luna).'

In reading the parenthesis referring to Mercury, one may be tempted to think that Milton used 'his' advisedly in the first edition; but this is hardly probable.

In considering the probability, apart from the internal evidence, that he often had Galileo's utterances in mind, we may recall Milton's statement in the *Areopagitica*:

'There it was that I found and visited the famous Galileo, grown old, a prisoner to the Inquisition, for thinking in astronomy otherwise than the Franciscan and Dominican licensers thought;'

the lines (261-3) from the Fifth Book of *Paradise Lost*:

As when by night the glass
Of Galileo, less assured, observes
Imagined lands and regions in the moon;

the lines from the First Book (287-291):

The moon, whose orb
Through optic glass the Tuscan artist views
At evening from the top of Fesole,
Or in Valdarno, to descry new lands,
Rivers or mountains in her spotty globe;

those from the Third Book (588-590):

There lands the fiend, a spot like which perhaps
Astronomer in the sun's lucent orb
Through his glazed optic tube yet never saw;

and those from *Paradise Regained* (4. 40-42).

It was not till the year 1609 that Galileo heard of the principle according to which he immediately constructed a telescope magnifying three diameters, a power which he quickly brought to thirty-three diameters; and it was early in the next year, the same in which he published his discoveries of the phases of Venus, that he made known the mountainous configuration of the moon's surface. Milton, who knew the one fact, and had probably gathered it from Galileo's own lips in conversation, may well have learned the other at the same time. If so, he no doubt ascertained that Galileo's theory of borrowed light applied only to the planet, and not to the fixed stars; hence 'stars,' l. 364, would mean 'planets.'

One might think that Milton would have been familiar with Galileo's discovery before his Italian journey, but this was not the case, if we may assume *Lycidas* 168-171, following Jerram, to apply to the morning star, and may trust its negative evidence. There we have:

So sinks the day-star in the ocean bed,
And yet anon repairs his drooping head,
And tricks his beams, and with new-spangled ore
Flames in the forehead of the morning sky,

the original of which Jerram assumes to have been *Æn.* 8. 589 ff. compared with Homer, *Il.* 5. 5-6. No more scientific is *Comus* 93-4:

The star that bids the shepherd fold
Now the top of heaven doth hold.

The same is true of *Lycidas* 30-31:

Oft till the star that rose at evening bright
Toward heaven's descent had sloped his westering wheel.

On this last passage Jerram says:

'He was far more likely to have erred in company with the ancients than to have corrected their mistakes by the light of modern discovery.'

However this may have been in his earlier manhood, our present study may tend to show that it is not unqualifiedly true of his riper years. An intimation to the same effect seems to be conveyed by the word 'circlet' in *P. L.* 5. 166-9:

Fairest of stars, last in the train of night,
If better thou belong not to the dawn,
Sure pledge of day, that crown'st the smiling morn
With thy bright circlet, praise him in thy sphere.

This seems to denote the rotundity observed by Galileo, and would hardly have occurred in the Latin period.

As the general sense of the last line came from Italy, so did also the peculiar meaning of the verb 'gild.' Shakespeare seems to have been the first English author to use the word in this way, referring to the sun. Thus we have (*Rich. II.* 1. 3. 146-7):

And those his golden beams to you here lent
Shall point on me and gild my banishment.

Again (*Sonn.* 33. 3-4):

Kissing with golden face the meadows green,
Gilding pale streams with heavenly alchemy;

with which may be compared *M. N. D.* 3. 2. 391-3:

Even till the eastern gate, all fiery-red,
Opening on Neptune with fair blessed beams,
Turns into yellow gold his salt green streams.

Other examples are *T. G.* 5. 1. 1; *Hen. V.* 4. 2. 1; *Hen. VIII.* 3. 2. 411; *Tit. Andron.* 2. 1. 6; *Sonn.* 28. 12; cf. *Sonn.* 18. 6; *Lucr.* 25; *L. L. L.* 4. 3. 26; etc., etc. This sense of 'gild' is appropriated by Milton in *P. L.* 3.559, besides our passage, and perhaps in *Comus* 95; *P. R.* 4.53; cf. *P. L.* 3.572,625; 5.187. Chaucer (*Book of the Duchesse* 338) has the sun shining 'with many glade gilden strems' where 'gilden' of course means 'golden,' and not 'gilded.'

The Italians thus use *indorare* and *aurare* (chiefly as *aurato*). Instances of *aurato* (cf. *aurata*) as early as Shakespeare are: Petrarca, *Sonn.* 187.1: 'Quando 'l sol bagna in mar l' *aurato carro*'; the same phrase Rinaldi, *Rime*, Venice, 1608, p. 191, and Baldi (1553-1617), *Naut.* 29; Baldi also has (68): 'Esce l' aurora, e con l' *aurato lume* Fuga dal ciel le mattutine Stelle;' (104): 'E già l' *aurata fronte* Discopria Febo mattutino,' Tasso, *Ger. Lib.* 15.47 (suggests the Miltonic line): 'Il sol, dell' *aurata luce* eterno fonte.' Similarly of *indorare*: Firenzuola (his *Apuleio* first published Florence, 1549), *Opere* 3.25 (Milan, 1802), in his *Apuleio*: 'I raggi del Sole, spuntando per le cime de' più alti monti, cominciavano a *indorar* la campagna;' Matteo Francesi, *Rime Burlesche* (1555): 'E il sole appena gli alti monti *indora*;' Tasso, *Ger. Lib.* 9.62: 'S'*indorava* la notte al divin lume;' and finally, nearest to Milton, Grazzini (Il Lasca, d. 1584), *Nanea* (authorship somewhat doubtful) 1.4 (*Mt.*): 'All'ora Che Febo del monton le corna *indora*.'

The French come later. Fénelon, *Télémaque* 3, has: 'Les rayons du soleil *doraient* le sommet des montagnes;' and elsewhere, 1. 21, p. 337: 'Dès que l'aurore vint *dorer* l'horizon;' Littré cites two other instances from Lamartine. Wakefield (*Observations on Pope*, 1796, p. 298), has noticed that Pope, *Dunciad* 2. 11-12, imitates Milton:

So from the sun's broad beams in shallow urns
Heaven's twinkling sparks draw light, and point their horns.

He justly adds that the twinkling sparks, evidently the fixed stars, have no horns.

ALBERT S. COOK.

Yale University.